

# *BHI Hazard Evaluation Tools and Techniques*

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## ***ISMS Workshop Presentation*** *December 5, 2000*

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**U.S. Department of Energy**  
**Bechtel Hanford, Inc.**  
Environmental Restoration Project

## **PRESENTATION PURPOSE:**

- To present Bechtel Hanford's recently improved hazard evaluation tools and techniques.
- To present the improvement process used to identify and develop new tools and techniques.

## **PRESENTATION OUTLINE:**

- Key Process Improvement Steps
- Key Challenges and Success Strategies
- Improved Tools and Techniques

## **KEY PROCESS IMPROVEMENT STEPS:**

- Identified Improvement Opportunities
- Evaluated and Selected Tools and Techniques
- Implemented New Tools and Techniques
- Obtained Feedback and Made Adjustments

# **HAZARD EVALUATION IMPROVEMENT OPPORTUNITIES**

- ISMS Verification Self Assessment
- DNFSB Comments
- Multi-discipline Task Force Workshop
- Improvement Objectives and Plan

# **HAZARD EVALUATION IMPROVEMENT OPPORTUNITIES** (continued)

- Rigorous, consistent, traceable process.
- Coordinated, integrated team approach.
- Graded approach.
- Timely approach, allowing work to be adapted to identified hazards.
- Workers involved early in work package preparation.

# **HAZARD EVALUATION IMPROVEMENT OPPORTUNITIES** (continued)

- Tools and techniques consistent with DOE, OSHA, and American Institute of Chemical Engineers (AIChE) guidance.
- Integrated analysis and documentation of all hazards and hazard controls.
- Hazard control documents require specific controls for specific work activities.
- Systematic approach to performing job walk-downs.

# HAZARD INTEGRATION TEAM EVALUATION

- Reviewed hazard evaluation processes used by other companies or DOE sites.
- Reviewed hazard evaluation techniques recommended by DOE, OSHA, and the AIChE.
- Identified advantages, disadvantages, resource and procedural impacts for potential tools and techniques.
- Determined which tools and techniques were most appropriate for BHI processes.



# **HAZARD INTEGRATION TEAM EVALUATION** (continued)

- Tailored the chosen tools and techniques for use at BHI.
- Solicited input from BHI project personnel, functional personnel, craft personnel, and management personnel.
- Verified the proposed changes addressed the Task Force Recommendations and DNFSB comments.

# Implemented New Tools and Techniques

- Produced new/revised procedures.
- Identified clear responsibilities for implementation.
- Developed clear implementation guidance that addressed new and existing work packages.
- Gave training to everyone involved in using new tools and techniques.
- Made experts available to help implement the new tools and techniques.

# **Obtained Feedback and Make Adjustments**

- Training Course Feedback
- Tool/Technique User Feedback
- Surveillances
- Self-assessments
- Independent Assessments

# Key Challenges and Success Strategies

- Completing changes within required timeframe.
- Minimizing impacts to ongoing project work.
- Acceptance of changes.

## **Completing Changes within Required Timeframe**

- Devoted adequate resources to selection team.
- Stayed focused on improvement objectives.
- Separated proposed changes into short-term and long-term improvements.

# Minimizing impacts to Ongoing Project Work

- Identified potential impacts and developed mitigation strategies.
- Solicited input from affected project groups to maximize efficiencies of new tools and techniques.
- Allowed reasonable implementation period.

## **Acceptance of Changes**

- Included representatives from affected groups on selection team.
- Discussed changes with broad range of personnel.
- Formally solicited and addressed comments from all affected groups.
- Used a dynamic, hands-on training approach.
- Actively solicited feedback during implementation.

# **BHI HAZARDS IDENTIFICATION PROCESS TOOLS**

- Pre-Job Walkdown Screening Form
- Pre-Job Walkdown Checklist Form
- Job Hazard Analysis Form



# **PRE-JOB WALKDOWN SCREENING FORM**

- Utilizes a graded approach in identifying associated risk at the early planning stage
- Identifies need for integrated Walkdown or tabletop
- Requires Project Safety Rep., Rad Eng, PEL & AFE concurrence

# THE SCREENING FORM

Pre-Job Walkdown Screening													
Work Package / OP No. _____		Rev. _____		Date _____									
Description of Work _____													
Initiator _____													
Pre-Screening Questions	Yes	No	Don't Know	Walkdown Team Considerations									
1. Does the work involve new hazards OR a change in work area conditions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	IH, IS, RC, ET, PE									
3. Could the work expose workers to a high radiation field?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	RC, PE									
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>For all "Yes" or "Don't Know" indicated answers above, do existing documents identify and account for all associated hazards?</p> </div> <div style="width: 30%;"> <p><input type="checkbox"/> Yes, (No walkdown/JHA required) list documentation:</p> </div> <div style="width: 30%;"> <p><input type="checkbox"/> No, A Walkdown is Required</p> <p><input type="checkbox"/> N/A, All numbered questions "No"</p> </div> <div style="width: 30%;"> <p><input type="checkbox"/> No, A Tabletop is Adequate Required Justification:</p> </div> </div>													
<p>If answer is "Yes," or "Don't Know," to any numbered question above, and Walkdown or Tabletop is required, identify the Team.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 25%;"><input checked="" type="checkbox"/> Craft</td> <td style="width: 25%;"><input checked="" type="checkbox"/> FS (Field Support)</td> <td style="width: 25%;"><input type="checkbox"/> IS (Industrial Safety)</td> </tr> <tr> <td><input type="checkbox"/> ET (Environmental Technology)</td> <td><input type="checkbox"/> IH (Industrial Hygiene)</td> <td><input type="checkbox"/> PE (Project Engineering)</td> </tr> <tr> <td><input type="checkbox"/> RC (RadCon)</td> <td><input type="checkbox"/> Others</td> <td></td> </tr> </table>					<input checked="" type="checkbox"/> Craft	<input checked="" type="checkbox"/> FS (Field Support)	<input type="checkbox"/> IS (Industrial Safety)	<input type="checkbox"/> ET (Environmental Technology)	<input type="checkbox"/> IH (Industrial Hygiene)	<input type="checkbox"/> PE (Project Engineering)	<input type="checkbox"/> RC (RadCon)	<input type="checkbox"/> Others	
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<input type="checkbox"/> RC (RadCon)	<input type="checkbox"/> Others												
<b>APPROVALS</b>													
Project Safety Rep. _____		Area Field Engineer _____											
Print / Sign	Date _____	Print / Sign	Date _____										
Radiological Engineer _____		Project Environmental Lead _____											
Print / Sign	Date _____	Print / Sign	Date _____										

# **PRE-JOB WALKDOWN CHECKLIST FORM**

- Identifies potential hazards during walkdown.
- Lesser to Greater control (Engineered-Administrative-PPE).
- Promotes integration.

# WALKDOWN CHECKLIST

## PRE-JOB WALKDOWN CHECKLIST

Specific Job Scope/Location:

Work Package/OP No. \_\_\_\_\_ Rev. \_\_\_\_\_ Initiator \_\_\_\_\_ Date \_\_\_\_\_

RC=RadCon IS=Industrial Safety IH=Industrial Hygiene ET=Environmental Technology PE=Project Engineering FS=Field Support

FUNCTIONAL ORG	HAZARD SOURCES	EXAMPLES	APPLIES		POTENTIAL HAZARD BARRIERS/CONTROLS																			
					Hazard Removal	De-energize	Lockout and Tagout	Physical Barrier	Proper Anchoring	Containment	Isolation (valves, piping, vacuum)	Pressure Relief Valve	Distance	Limit Time	Ventilation	Environmental Permits / Plans	Cultural Review	Ecological Review	Apply Fixative	Protective Clothing / Gloves / Equipment	Respiratory Protection	Inventory Control	Warning Sound/Light	Proper Packaging
			Y	N																				
IS/IH/PE/FS	Electrical	High Voltage and Current Sources																						
		Transformers																						
		Batteries/Capacitors																						
		Static Electricity																						
IS/IH/PE/FS	Motion	Shears, Sharp Edges, Pinch Points, Punctures, Machinery																						
		Vehicles, Forklifts, Man-lifts, Man-baskets, Cranes																						
		Mass in Motion/Flying debris/dust																						
		Repetitive																						
		Rotating Equipment																						
IS/PE/FS	Gravity-Mass	Falling																						
		Falling Objects																						
		Open Water (pools, basins, flooding)																						
		Access/Egress																						
		Roof/Floor Overloading																						
		Lifting																						
		Tripping, Slipping																						

# **JOBS HAZARD ANALYSIS FORM**

- **Provides a single Haz ID document through integrated involvement.**
- **Identifies specific work steps/activities.**
- **Identifies hazards associated with those steps/activities.**
- **Identifies appropriate mitigation methods specific to the task**

# JOB HAZARD ANALYSIS

JOB HAZARD ANALYSIS FORM		
Job Scope and Location		Work Package / OP No. _____ Rev. _____
_____ Date Analysis Performed _____		
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> HRT Members (Print Name / Title) </div> <div style="width: 60%;"> <div>_____ Team Leader _____</div> <div>_____</div> <div>_____</div> <div>_____</div> </div> </div>		
Job Steps	Associated Hazard and Evaluation	Barriers and/or Controls
Approved By HRT Members	_____ Team Leader Print / Sign / Date	_____ Print / Sign / Date
	_____ Print / Sign / Date	_____ Print / Sign / Date
	_____	_____
	_____ Print / Sign / Date	_____ Print / Sign / Date